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Development of Prosocial, Individualistic, and Competitive Orientations: Theory and Preliminary Evidence

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The authors adopt an interdependence analysis of social value orientation, proposing that prosocial, individualistic, and competitive orientations are (a) partially rooted in different patterns of social interaction as experienced during the periods spanning early childhood to young adulthood and (b) further shaped by different patterns of social interaction as experienced during early adulthood, middle adulthood, and old age. Congruent with this analysis, results revealed that relative to individualists and competitors, prosocial individuals exhibited greater levels of secure attachment (Studies 1 and 2) and reported having more siblings, especially sisters (Study 3). Finally, the prevalence of prosocials increased—and the prevalence of individualists and competitors decreased—from early adulthood to middle adulthood and old age (Study 4).

Traditional theories and insights assume that the principle of *rational self-interest* or *economic man* reflects the prevailing motivation among humankind (Luce & Raiffa, 1957; Von Neuman & Morgenstern, 1947; cf. Roth, 1988). However, more recent theoretical developments have indicated that individuals systematically differ in the manner in which they approach interdependent others. Some people are inclined to give interdependent others the benefit of the doubt and approach them cooperatively, whereas other people are inclined to approach interdependent others in a less cooperative manner. Such individual differences are related to *social value orientation*, defined as stable preferences for certain patterns of outcomes for oneself and others (McClintock, 1978; Messick & McClintock, 1968).

Although a variety of different social value orientations can be distinguished from a theoretical point of view (e.g., Knight & Dubro, 1984), in this article we address a three-category typology of social value orientation, examining differences between prosocial, individualistic, and competitive orientations. *Prosocials* tend to maximize outcomes for both themselves and others (i.e., cooperation) and to minimize differences between outcomes for themselves and others (i.e., equality); *individualists* tend to maximize their own outcomes with little or no regard for others' outcomes; and *competitors* tend to maximize their own outcomes relative to others' outcomes, seeking relative advantage over others. The three social value orientations are predictive of behavior in a variety of social dilemma tasks, with prosocials exhibiting clear tendencies toward cooperation (unless others fail to reciprocate), and individualists and competitors exhibiting tendencies toward maximizing their own and relative gain, even when interdependent others evidence high levels of cooperation (e.g., Kuhlman & Marshello, 1975; Liebrand & Van Run, 1985; McClintock & Liebrand, 1988; Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994). Moreover, social value orientations are predictive of helping behavior, judgments of everyday life incidents of cooperation and competition, decisions and judgments regarding commuting choices, and willingness to sacrifice in close relationships (Beggan, Messick, & Allison, 1988; McClintock & Allison, 1989; Van Lange, Agnew, Harinck, & Steemers, in press; Van Vugt, Meertens, & Van Lange, 1995).

Given that social value orientation accounts for behavior and interaction patterns in various domains of interdependence, it becomes important to ask the obvious: Where do these social value orientations come from? Could they be, at least in part, a product of early social experiences? Do these social value orientations change in any systematic manner over the course of a lifetime? In the present research, we adopted an interdependence analysis of social value orientation (Kelley & Thibaut, 1978), proposing that prosocial, individualistic, and competitive orientations are (a) partially rooted in different patterns of social interaction as experienced during the periods spanning early childhood to young adulthood and (b) further shaped by different patterns of social interaction as experienced during early adulthood, middle adulthood, and old age. By using interdependence constructs and principles, as well as empirical research relevant to the development of social value orientations, we advance several hypotheses regarding the

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relationship between social value orientation and adult attachment styles (Studies 1 and 2), social value orientation and number of siblings (Study 3), and social value orientation and age differences among adults (Study 4).

Interdependence Analysis of Social Value Orientation

The concept of social value orientation reflects distinct ways in which outcomes for self and others are evaluated, some of which represent broader considerations that extend and complement the pursuit of immediate self-interest (e.g., prosocial and competitive motivation). Interdependence theory has conceptualized such broader considerations in terms of transformation of motivation, assuming that given interdependence situations (i.e., the given matrix) are transformed into subjective interdependence situations (i.e., the effective matrix) that ultimately guide interdependent behavior (Kelley & Thibaut, 1978). Such stable transformational tendencies, at least in part, are assumed to be shaped by *social interaction experiences*, which are a function of the interdependence features of a situation and the behavior of the two or more persons involved (cf. Kelley, 1997). For example, the experience of cooperative interaction is a function of the features of interdependence underlying a situation (i.e., whether such features permit cooperative and noncooperative choices, such as in the prisoner's dilemma) and the cooperative behavior exhibited by both persons.

One important interdependence feature of situations that guides social interaction is the correspondence of outcomes, or the degree to which preferences correspond versus conflict. A situation characterized by high correspondence does not permit cooperative and noncooperative choices, in that a choice serving one's own interests also tends to serve the other's interests (i.e., such situations challenge individuals' ability to coordinate). A situation characterized by intermediate correspondence generally does permit cooperative and noncooperative choices, in that the pursuit of the other's well-being and joint well-being can only occur at some cost to one's own well-being. Situations characterized by perfect noncorrespondence represent a perfect conflict of interest, such that there is no basis for pursuing joint well-being. Prior research has revealed that experience with such situations may shape transformational tendencies. For example, individuals tend to develop norms and agreements to protect their own and others' well-being, particularly when joint well-being is increasingly challenged by a stronger conflict of interest (e.g., Thibaut, 1968; Thibaut & Faucheux, 1965).

Transformational tendencies may also be shaped by patterns of social interaction that are largely conditioned by another person's behavior. For example, repeated experience with others who tend to pursue self-interest or relative advantage over others may lead people to develop an individualistic or competitive orientation rather than a prosocial orientation. Alternatively, repeated experience with others who engage in prosocial transformations may lead people to develop a prosocial orientation. Consistent with this argument, prior research has revealed that prosocials expect others to be more cooperative than do individualists and competitors (e.g., Kuhlman & Wimberley, 1976). In a related manner, individuals' own tendencies to exhibit cooperation or noncooperation affect patterns of social interaction, which in turn are likely to shape (and confirm) one's own transformational tendencies. Indeed, initial beliefs regarding others' cooperative and noncooperative behavior are likely to be confirmed through individuals' own behavior (especially among those who approach others noncooperatively; cf. Kelley & Stahelski, 1970). Thus, on the basis of interdependence theory, we assumed that social interaction experiences, which are a function of the situation and the two (or more) persons involved, are the basis for the development of relatively stable social value orientations.

It is clear that different individuals experience different histories of social interaction. For example, young children who have repeatedly experienced interactions in which parents are very attentive to their elementary needs are likely to develop trust and security, which may promote prosocial orientation. Conversely, children who have repeatedly experienced interactions in which parents are not very attentive to their needs are likely to develop distrust and insecurity, which may enhance self-centered orientations. As another example, relative to individuals raised in small families, individuals raised in large families may have acquired greater experience with situations entailing some conflict of interest (e.g., scarcity of material or immaterial resources, such as the sharing of toys or attention from parents), which produces patterns of social interaction that may in turn shape individuals' social value orientations. Thus, as a consequence of such interaction experiences, individuals acquire interpersonal dispositions, reflected in the probability of approaching certain classes of interdependent situations in a prosocial, individualistic, or competitive manner.[1]

Although social value orientations are relatively stable over time, such transformational tendencies may be further shaped by patterns of social interaction as one experiences throughout a lifetime, from early adulthood to old age (cf. Erikson, 1980). It is plausible that throughout a lifetime, individuals acquire greater experience with a more varied set of social interactions (e.g., greater experience with others depending on you, greater experience with partners who differ in their approach to interdependence situations). Such extended experience may shape the further development of social value orientation.

Interaction Experiences and Social Value Orientations: Empirical Evidence

Although interdependence theory emphasizes the role of social interaction experiences in shaping social value orientations,

[1] Interaction experiences need not always be direct, but may also be vicarious (i.e., provided by social models; cf. Bandura, 1969) and complemented by explicit teaching of rules and norms relevant to interdependent behavior. Thus, we did not assume that social interaction experiences are limited to one's own, direct experience. Moreover, we did not assume that social interaction experiences are always carefully evaluated, nor that the development of social value orientation occurs in a calculated, systematic manner. We believe that, over extended experience with different social interactions, individuals develop habitual tendencies to react to specific patterns of interdependence situations in specific ways, such that the transformation process occurs quite rapidly, with little or no conscious thought. (Of course, this is not to argue that one never reevaluates habitual tendencies, even if one was to experience similar interdependent situations and partners; indeed, one is likely to do so when experiencing poor outcomes, when being reprimanded, or when interdependent others tend to react in unforeseen ways.)

this analysis does not deny that there may be genetic factors or differences in our biological makeup that account for the development of different social value orientations (for empirical evidence, see Olweus, 1979; Rushton, Fulker, Neale, Nias, & Eysenck, 1986). Rather, interdependence theory assumes that above and beyond that with which we are born—above and beyond the opportunities and limitations dictated by our biological makeup—individuals develop preferences and adaptations on the basis of experience with situations of interdependence (cf. Rusbult & Van Lange, 1996). Is there evidence relevant to this basic assumption? Are differences in social value orientation at least in part a function of social interaction experiences?

Some research has revealed that tendencies toward prosocial behavior increase with age, even among very young children (i.e., 2 to 4 years old; e.g., Durkin, 1995). However, also among somewhat older children (i.e., up to young adolescence), there is a gradual increase in prosocial behavior, including cooperation and equality (e.g., Eisenberg & Fabes, 1991; Knight & Dubro, 1984; Rushton, 1975). Moreover, there is research indicating that the development of tendencies toward cooperative and competitive behavior differs as a function of culture. A consistent finding across a variety of studies is that children raised in cultures characterized by high levels of collectivism, interpersonal closeness, and interdependence tend to exhibit greater cooperation and less competition than children raised in cultures characterized by relatively low levels of collectivism, interpersonal closeness, and interdependence (i.e., comparisons of children raised in homogeneous, rural environments and those raised in heterogeneous, urban environments; Knight, Kagan, & Buriel, 1981; Knight, Kagan, Nelson, & Gumbiner, 1978; Madsen & Lancy, 1981; McClintock, 1974). Although such findings allow for several interpretations, they are congruent with the general assumption that social interaction experiences shape transformational tendencies.

Study 1

The purpose of Study 1 was to examine the relationship between social value orientation and attachment styles, a social disposition that is very explicitly assumed to be a product of past interaction experiences. Following traditional conceptualizations of attachment theory (Bowlby, 1969, 1973, 1980; see also Ainsworth, Blehar, Waters, & Wall, 1978), the field of personality and social psychology has recently emphasized the contribution of adult attachment styles in understanding patterns of interaction in ongoing relationships (e.g., Collins & Read, 1990; Hazan & Shaver, 1987; Simpson, 1990). It is important to note that attachment theory assumes that early childhood experiences with the primary caregiver (usually the mother) form the basis of the development of a particular attachment style. Traditionally, three attachment styles have been delineated, often called *secure, anxious–ambivalent,* and *avoidant* attachment (cf. Ainsworth et al., 1978). Secure individuals tend to find it easy to get close to others and do not tend to worry about being abandoned or about someone getting too close to them. Anxious–ambivalent individuals tend to seek closeness but feel that others are reluctant to become as close as they would like. Finally, avoidant individuals feel somewhat uncomfortable being close to others and tend to be somewhat distrustful of others.

Should the three differing social value orientations be associated with these three attachment styles? Recall that Bowlby (1969, 1973, 1980) reasoned that the dimension of security versus insecurity is most important in accounting for different behaviors and responses of young children (e.g., probability of crying when left alone), a claim supported by subsequent research by Ainsworth et al. (1978). How can the dimension of security versus insecurity be understood in terms of an interdependence analysis? We suggest that the early development of secure versus insecure attachment is at least partially a result of early patterns of social interaction, which presumably are importantly influenced by the primary caregiver. In particular, given that a young child is highly dependent on the primary caregiver, secure individuals have acquired greater experience than insecure individuals with interactions in which elementary needs and preferences are fulfilled by the primary caregiver.

Accordingly, secure individuals may have learned to perceive interdependent situations and partners as safe and secure, readily behaving in a trusting manner, thereby increasing the possibility of developing cooperative patterns of interactions with interdependent others. Such experiences are likely to enhance prosocial orientation. In contrast, insecure individuals may have learned to perceive interdependent situations and partners as dangerous and risky, behaving in a rather distrusting manner, thereby running the risk of developing noncooperative patterns of interaction with interdependent others. Such experiences are likely to enhance individualistic—and perhaps competitive—orientation. Thus, we advanced the general hypothesis that prosocials will exhibit greater levels of secure attachment than individualists and competitors. We refer to this prediction as the *prosocial-security hypothesis.*[2]

For more exploratory purposes, we were interested in examining the link between social value orientations and levels of anxious–ambivalent attachment and levels of avoidant attachment. Given that higher levels of these attachment styles indicate a fair amount of insecurity, one could advance the prediction that, relative to individualists and competitors, prosocials will evidence lower levels of anxious–ambivalent attachment and lower levels of avoidant attachment. However, levels of anxious–ambivalent and avoidant attachment represent not only relatively low levels of security, but also differential preferences for seeking versus avoiding intimacy or interdependence (for further discussion, see Bartholomew & Horowitz, 1991; Shaver et al. 1996). Given that individualists and competitors are more likely

[2] The prosocial-security hypothesis may also be based on comparisons of taxonomies of attachment styles and models of social value orientation. Recent taxonomies of attachment styles have conceptualized security in terms of the degree to which an individual has developed a positive model of both self and others; avoidance has been assumed to represent a positive model of self but a negative model of others; and anxious–ambivalent attachment has been assumed to represent a negative model of self but a positive model of others (e.g., Bartholomew & Horowitz, 1991). Similarly, the concept of social value orientation has been conceptualized in terms of self–other models, with prosocials assigning positive weights to the well-being of self and others, individualists assigning positive weights to primarily the well-being of self, and competitors assigning positive weight to the well-being of self and negative weight to the well-being of others (e.g., McClintock & Liebrand, 1988).

than prosocials to avoid or withdraw from patterns of interdependence (e.g., Orbell & Dawes, 1993), another (albeit indirect) variation of the prosocial-security hypothesis would be that prosocials exhibit lower levels of avoidant attachment relative to individualists and competitors. Given that prosocials might be more secure, as well as more appreciative of interdependent relationships than individualists and competitors, we advanced no formal hypothesis regarding social value orientation differences for levels of anxious–ambivalent attachment. Finally, past research has revealed no strong evidence indicating that men and women differ in terms of adult attachment styles (e.g., Shaver et al., 1996). In a highly exploratory vein, we examined whether the hypothesized relationship between social value orientation and level of secure attachment would be influenced by gender.

Method

Participants and design. A total of 573 individuals (338 women, 228 men, 7 unidentified) participated in this research (mean age: 22.3 years). They were recruited at several locations at the campus of the Free University, Amsterdam, including the university library and cafeteria. The design was a 3 (social value orientation: prosocials vs. individualists vs. competitors) × 2 (gender: women vs. men) factorial with measures of secure, avoidant, and anxious–ambivalent attachment as the three dependent variables.

Procedure. Differences in social value orientation were assessed by using a series of decomposed games (Messick & McClintock, 1968), which involve making choices among combinations of outcomes for oneself and for another person. In the current study, we used a nine-item decomposed game measure of social value orientation, an efficient and easy-to-administer instrument that was adopted from prior research (e.g., Van Lange & Kuhlman, 1994; Van Lange et al., in press). The Appendix presents this decomposed game measure. As can be seen in this Appendix, the other was said to be someone whom participants did not know and whom they would never knowingly meet in the future. This allowed us to examine participants' general tendencies toward others. Also, the instructions noted that the other would also make choices; this allowed us to frame the choice situations as ones involving some interdependence between the participant and the other. Finally, outcomes were presented in terms of points, and participants were asked to imagine that the points had value to themselves as well as to the other person. Similar instructions have been used in past research (see Kuhlman & Marshello, 1975; McClintock & Allison, 1989; for other decomposed game measures, see Knight & Dubro, 1984; Liebrand, Jansen, Rijken, & Suhre, 1986). These measures of social value orientation have generally revealed good internal consistency and test–retest reliability over a period ranging from 2 months to 6 months (e.g., Kuhlman, Camac, & Cunha, 1986; Van Lange & Semin-Goossens, 1997).

As can been seen in the Appendix, an example of a decomposed game is the choice among three options: Option A, 480 points for self and 80 points for other; Option B, 540 points for self and 280 points for other; and Option C, 480 points for self and 480 points for other. In this example, Option A represents the competitive choice, because it provides a larger difference between one's own and the other's outcomes (480 − 80 = 400) than does either Option B (540 − 280 = 260) or Option C (480 − 480 = 0). Option B represents the individualistic choice, because one's own outcomes are larger (540) than are those in Option A (480) or Option C (480). Finally, Option C represents the prosocial choice, because it provides a larger joint outcome (480 + 480 = 960) than does either Option A (480 + 80 = 560) or Option B (540 + 280 = 820); also, Option C represents a smaller discrepancy between one's own and other's outcomes (480 − 480 = 0) than does either Option A (480 − 80 = 400) or Option B (540 − 280 = 260).

Participants were classified as either prosocial, individualistic, or competitive if at least six choices were consistent with one of these social value orientations. Following these criteria, we identified 248 participants as prosocial, 164 as individualistic, and 46 as competitive; 115 participants (20%) could not be classified. Social value orientation exhibited a marginal relationship with gender, χ^2 (2, N = 453) = 5.27, p < .10, with prosocials being somewhat more prevalent among women (58.5%) than among men (47.7%) and individualists being somewhat less prevalent among women (32.2%) than among men (41.0%); the percentages of competitors were about equal among women (9.3%) and men (11.3%).

Measurement of adult attachment styles. Measurement of levels of secure, avoidant, and anxious–ambivalent attachment was based on a 13-item measure adapted from Hazan and Shaver (1987) and validated by Carnelley and Janoff-Bulman (1992). However, given that the purpose of Study 1 was to assess general attachment styles (i.e., attachment relevant to one's interpersonal dealings with others in general, not with one's close relationship partner per se), we excluded items that involved attachment to the current partner (e.g., "I worry that a love partner might not really love me"). Therefore, five items were used to assess level of secure attachment (e.g., "I find it easy to trust others," "I find it easy to get close to others", and "I feel comfortable having other people depend on me"); level of avoidant attachment was measured by using three items (e.g., "I am nervous when anyone gets too close"); finally, level of anxious–ambivalent attachment was assessed by using three items (e.g., "I find that other people don't want to get as close as I would like"). The internal consistency of the latter two scales was acceptable (level of avoidant attachment, 3 items, α = .66; level of anxious–ambivalent attachment, 3 items, α = .67).

The internal consistency of the five items measuring level of secure attachment was judged to be unacceptable (α = .46); however, after discarding two items the resultant internal consistency was judged to be acceptable (α = .57). Therefore, in our analyses we examined the average scores of the three-item scales measuring level of secure, avoidant, and anxious–ambivalent attachment. The current scales parallel levels of internal consistency observed in the United States (α = .62, .59, and .68, respectively, for secure, avoidant, and anxious–ambivalent attachment; Carnelley & Janoff-Bulman, 1992). The data of three participants were discarded because of missing values.

Results and Discussion

We conducted a 3 (social value orientation: prosocials vs. individualists vs. competitors) × 2 (gender: women vs. men) multivariate analysis of variance (MANOVA) with the three-item measures of secure, anxious–ambivalent, and avoidant attachment styles as dependent measures. This analysis revealed a multivariate main effect for social value orientation, F(6, 886) = 3.05, p < .01. At the univariate level, the main effect for social value orientation was significant for level of secure attachment, F(2, 444) = 7.07, p < .001, and marginal for both level of avoidant attachment, F(2, 444) = 2.47, p < .10, and level of anxious–ambivalent attachment, F(2, 444) = 2.76, p < .10. The two-factor MANOVA did not reveal any effects involving gender, indicating that the association of social value orientation and secure attachment is independent of participant's gender.

Consistent with the prosocial-security hypothesis, prosocials (M = 6.24, SD = 1.38) exhibited greater levels of secure attachment than did individualists (M = 5.92, SD = 1.35) or competitors (M = 5.51, SD = 1.59). Subsequent planned comparisons revealed a significant contrast between prosocials versus individualists and competitors, F(1, 444) = 11.09, p < .001, and a

marginal difference between individualists and competitors, $F(1, 444) = 3.04$, $p < .10$. These findings are presented in Figure 1.

Second, congruent with the prosocial-security hypothesis, contrasts relevant to the marginal relationship between social value orientation and avoidant attachment revealed that prosocials ($M = 3.56$, $SD = 1.61$) exhibited lower levels of avoidant attachment than did individualists ($M = 3.92$, $SD = 1.48$) and competitors ($M = 3.86$, $SD = 1.48$), respectively, $F(1, 444) = 4.88$, $p < .05$. The contrast between individualists and competitors was not significant. Finally, relevant to the marginal relationship between social value orientation and levels of anxious–ambivalent attachment, subsequent comparisons revealed a significant contrast of prosocials ($M = 4.93$, $SD = 1.60$) versus individualists ($M = 4.63$, $SD = 1.71$) and competitors ($M = 4.55$, $SD = 1.80$), respectively, $F(1, 444) = 4.63$, $p < .05$. The contrast between individualists and competitors was not significant.

Study 2

Study 1 provided good support for the prosocial-security hypothesis, in that prosocials described their feelings and experiences relevant to others in general to be more secure (and somewhat less avoidant) than did individualists and competitors. Study 2 was designed to examine the association between social value orientation and partner-specific forms of secure attachment, focusing on feelings and experiences of secure attachment relevant to the current partner with whom participants were intimately involved.

Method

Participants and design. A total of 136 Dutch individuals (63 women, 73 men) participated in this research (mean age: 23.8 years). They were recruited at several locations at the campus of the Free University, Amsterdam, including the university library and cafeteria. All individuals were involved in a relationship of at least 3 months in duration (mean relationship duration: 31 months). The design was a 3 (social value orientation) × 2 (gender) factorial, with measures of secure, avoidant, and anxious–ambivalent attachment as the three dependent variables.

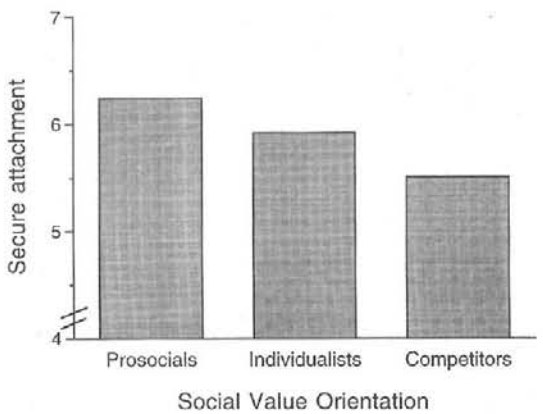

Figure 1. Mean levels of attachment security among prosocials, individualists, and competitors (Study 1).

Procedure. The survey included an instrument measuring individuals' social value orientation and an instrument measuring levels of secure, avoidant, and anxious–ambivalent attachment. Social value orientations were measured as in Study 1 (see Appendix). Following the same criteria as in Study 1 (i.e., making at least six consistent choices), we identified 66 prosocials, 35 individualists, and 19 competitors (16 participants made fewer than six consistent choices and therefore could not be classified in one of the above groups). Unlike Study 1, there was no evidence of an association between social value orientation and gender, $\chi^2(2, N = 120) = 2.14$, *n.s.*

In measuring levels of secure, avoidant, and anxious–ambivalent attachment, we used descriptions adapted from Hazan and Shaver's (1987) three-prototype descriptions of how people typically feel in relationships. In light of the present purposes, there were three notable differences between Hazan and Shaver's measure and the present measure. First, whereas the descriptions used by Hazan and Shaver focus on feelings and experiences relevant to others in general, the current descriptions were reworded so as to measure feelings and experiences relevant to the participant's current partner. Second, rather than using phrases such as "getting close" or "being close," we used phrases such as "sharing intimate feelings and experiences." The reasons for this were that (a) the term "closeness" does not translate perfectly into Dutch and (b) we wanted to focus on fairly concrete experiences and feelings. Finally, whereas Hazan and Shaver asked participants to endorse the description that best described their feelings and experiences, we asked participants to rate each of these descriptions in terms of how well they described themselves (1 = *describes me not at all*, 4 = *describes me somewhat*, 7 = *describes me very well;* for similar procedures, see Shaver & Brennan, 1992).

Translated from Dutch, the respective descriptions measuring levels of secure, avoidant, and anxious–ambivalent attachment read as follows:

> I find it relatively easy to share intimate feelings and experiences with my partner and am comfortable to be dependent on one another. I don't often worry that my partner abandons me, or that my partner wants to share too intimate feelings and experiences. (*secure attachment*)

> I am somewhat uncomfortable when my partner and I share very intimate feelings and experiences. I find it difficult to trust my partner completely, difficult to allow myself to depend on him/her. I am nervous when we share very intimate feelings and experiences, and often my partner wants me to be more intimate than I feel comfortable being. (*avoidant attachment*)

> I wish that my partner would share more intimate feelings and experiences with me. I often worry that my partner doesn't really love me or won't want to stay with me. I want to merge completely with my partner, and this desire sometimes scares my partner. (*anxious–ambivalent attachment*)

Finally, given that individuals may be inclined to present themselves (or indirectly, their romantic partner or relationship) in a desirable manner, we included an instrument measuring tendencies toward social desirability (12 true–false items adapted from Crowne & Marlowe, 1964). As in some other research (e.g., Van Lange et al., 1997), the internal consistency ($\alpha = .49$) was clearly lower than ideal, yet we judged it to be acceptable in light of the fact that this scale focuses on several different tendencies and behaviors in a variety of situations (e.g., tendencies to gossip, tendencies to carefully read political programs prior to voting) and because this instrument has been widely used in prior research.

It appeared that only one of the constructs assessed in the present research was significantly linked to social desirability. There was a

significant link between level of anxious–ambivalent attachment and social desirability, $r(115) = .26$, $p < .01$, suggesting that the expression of the desire for closeness, yet worrying that others do not wish to become equally close, is to some degree desirable. Such links with levels of secure attachment, $r(115) = -.17$, and levels of avoidant attachment, $r(115) = .07$, were not significant. Moreover, social value orientation was not significantly linked to social desirability, $F(2, 115) = 2.53$, suggesting that the measurement of prosocial, individualistic, and competitive orientations by means of decomposed games is relatively free of tendencies toward presenting oneself in a socially desirable manner. In the analyses reported below, the data of two participants were discarded because of missing values.

Results and Discussion

We conducted a 3 (social value orientation) × 2 (gender) MANOVA, with the measures of secure, anxious–ambivalent, and avoidant attachment styles as dependent measures. This analysis revealed a significant multivariate main effect for social value orientation, $F(6, 222) = 3.27$, $p < .005$. At the univariate level, the main effect for social value orientation was found to be significant for level of secure attachment, $F(2, 112) = 5.53$, $p < .005$, and nonsignificant for both level of avoidant attachment, $F(2, 112) = 2.54$, and level of anxious–ambivalent attachment, $F(2, 112) = .12$. The two-factor MANOVA did not reveal any effects involving gender, indicating that the association of social value orientation and secure attachment is independent of participant's gender.

As can be seen in Figure 2, prosocials ($M = 5.25$, $SD = 1.90$) exhibited greater levels of secure attachment than did individualists ($M = 4.91$, $SD = 1.76$) or competitors ($M = 3.68$, $SD = 2.14$). Consistent with the prosocial-security hypothesis, planned comparisons revealed significant contrasts between prosocials versus individualists and competitors, $F(1, 112) = 4.94$, $p < .05$, and between individualists and competitors, $F(1, 112) = 6.11$, $p < .05$.

Study 3

Studies 1 and 2 were designed to provide evidence in support of the link between social value orientation and levels of secure attachment, which was explicitly assumed to be developed by early childhood experiences with the primary caregiver. Of course, demonstrating a simple link between social value orientation and level of secure attachment provides very indirect evidence in support of the more general claim that differences in social value orientation are at least partially rooted in childhood experiences of social interaction. Two limitations, in particular, are worth discussing. First, differences in level of secure attachment are assumed to be a function of interactions between caregiver and child. However, development of social value orientations may also be rooted in patterns of interaction with peers during young childhood and early adolescence. Second, demonstrating a link between secure attachment and social value orientation fails to provide direct insight into more "objective" features that may underlie differences in social interaction as experienced during childhood and early adolescence.

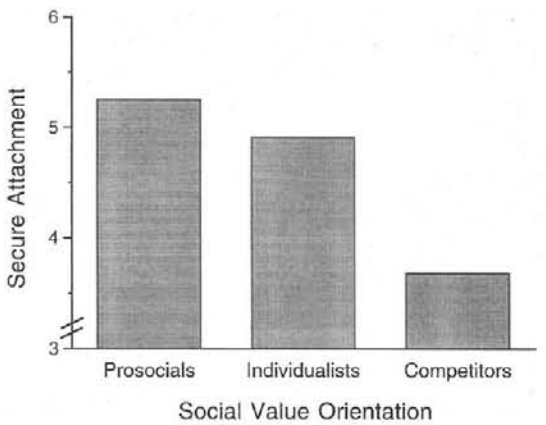

Figure 2. Mean levels of attachment security among prosocials, individualists, and competitors (Study 2).

Study 3 addressed these limitations by examining the association between social value orientation and number of siblings. How might different transformational tendencies develop in the context of few versus many other siblings? We propose that the number of siblings has a substantial influence on interaction experiences, particularly during childhood. Number of siblings should be linked to the frequency—and possibly the intensity—with which one is confronted with situations characterized by intermediate or low correspondence of outcomes. The greater the number of siblings, the more likely is it that individuals will face situations in which particular resources have to be shared, resources that provide the basis for outcomes, material outcomes (e.g., toys, space) as well as psychological outcomes (e.g., attention from parents; cf. Hoffman, 1991). How might such interdependence features affect social interactions? How might number of siblings shape social value orientation?

Given repeated experience with situations of intermediate or low correspondence, individuals may adapt in such a manner as to approach these situations in a cooperative and coordinating manner, thereby gradually learning the functional value of acting in a collectively beneficial manner. This reasoning suggests that individuals that are part of larger families are more likely to develop prosocial orientation. Indeed, the well-established finding that children raised in cultures characterized by high levels of collectivism and interdependence tend to exhibit greater cooperation than children raised in cultures characterized by relatively low levels of collectivism and interdependence is consistent with this argument, in that the former children typically have been raised in larger families than the latter children (e.g., children raised in rural parts of Mexico vs. children raised in the United States; Madsen & Shapira, 1977). Thus, this reasoning leads one to expect that prosocials will have a greater number of siblings than will individualists and competitors (i.e., *sibling-prosocial hypothesis*).

An alternative line of reasoning suggests that repeated experience with situations of intermediate or low correspondence, especially in the context of larger groups, gives rise to noncooperative interaction experiences. For example, prior research on social dilemmas has demonstrated that cooperative interactions decline as groups are somewhat larger in size (e.g., in comparisons of groups of 2, 3, and up to 7 persons; Bonacich, Shure, Kahan, & Meeker, 1976; Hamburger, Guyer, & Fox, 1975). If this is true, such noncooperative interaction experiences should

give rise to somewhat lower levels of trust and increased pessimism regarding individuals' willingness and ability to act in a collectively beneficial manner, thereby instigating the development of proself (i.e., individualistic and competitive) orientation. Thus, this reasoning leads one to expect that prosocials will have a smaller number of siblings than will individualists and competitors (i.e., *sibling-proself hypothesis*).

Relevant to the two hypotheses noted above, we examined the relationship between social value orientation and birth order. Later borns obviously grow up with a sizable number of siblings, whereas early borns will only later experience the influence of more siblings. From this perspective, we can advance two specific predictions. According to the sibling-prosocial hypothesis, prosocials should have a greater number of older siblings than individualists and competitors. Conversely, according to the sibling-proself hypothesis, prosocials should have a smaller number of older siblings than individualists and competitors.

Finally, in a highly exploratory vein, we examined the relationship between social value orientation and the sex ratio of siblings. Prior research has revealed a link (albeit weak) between social value orientation and gender, such that among women prosocials tend to be a bit more prevalent than among men. Indeed, Study 1 revealed a marginal link between these variables. Hence, it is possible that the development of prosocial orientation increases with the presence of female siblings rather than male siblings. However, given the speculative nature of such reasoning and the fact that more complex lines of reasoning are possible (e.g., arguments suggesting specific patterns of interactions between one's own gender and the sex-ratio of siblings), we advanced no formal prediction for the link between social value orientation and the sex-ratio of siblings.

Method

Participants and design. A total of 631 Dutch individuals (335 women, 295 men, 1 unidentified; mean age: 24.0 years) participated in several survey and laboratory studies that included questions relevant to number of siblings, birth order, and sex ratio of siblings. In some studies, participants were recruited at specific locations at the Free University, Amsterdam (e.g., library, cafeteria), whereas in other studies participants were recruited by means of an advertisement in the university paper.

Procedure. In all studies, social value orientation was assessed as in Studies 1 and 2. Following the same criteria as in Studies 1 and 2 (i.e., making at least six consistent choices), we identified 311 prosocials (57%), 160 individualists (30%), and 73 competitors (13%), a distribution similar to those found in prior research (87 participants made fewer than six consistent choices and therefore could not be classified in one of the above groups.) Unlike Study 1, there was no evidence of a significant association between social value orientation and gender, $\chi^2(2, N = 544) = .84$, *n.s.* The questionnaire asked participants to list the total number of siblings older than themselves, the total number of siblings younger than themselves, as well as the total number of brothers and the total number of sisters. The data of three participants were discarded because of missing values.

Results and Discussion

The association between social value orientation and number of siblings was analyzed by using a 3 (social value orientation: prosocials vs. individualists vs. competitors) × 2 (gender: women vs. men) analysis of variance (ANOVA). Of course, this analysis did not assume that social value orientation causes variations in the so-called dependent measures—indeed, the reverse order of causation is more plausible. We used the ANOVA framework because the dependent measure complied with a ratio level of measurement (i.e., the same holds for the other dependent measures, including number of siblings older than the participant, the number of siblings younger than the participant, the number of brothers, and the number of sisters). This analysis revealed a significant main effect for social value orientation, $F(2, 535) = 4.82$, $p < .01$. Consistent with the sibling-prosocial hypothesis, Panel A of Figure 3 reveals that the number of siblings is greater for prosocials ($M = 2.03$, $SD = 1.56$) than for individualists ($M = 1.63$, $SD = 1.00$) and competitors ($M = 1.71$, $SD = 1.35$). Subsequent planned com-

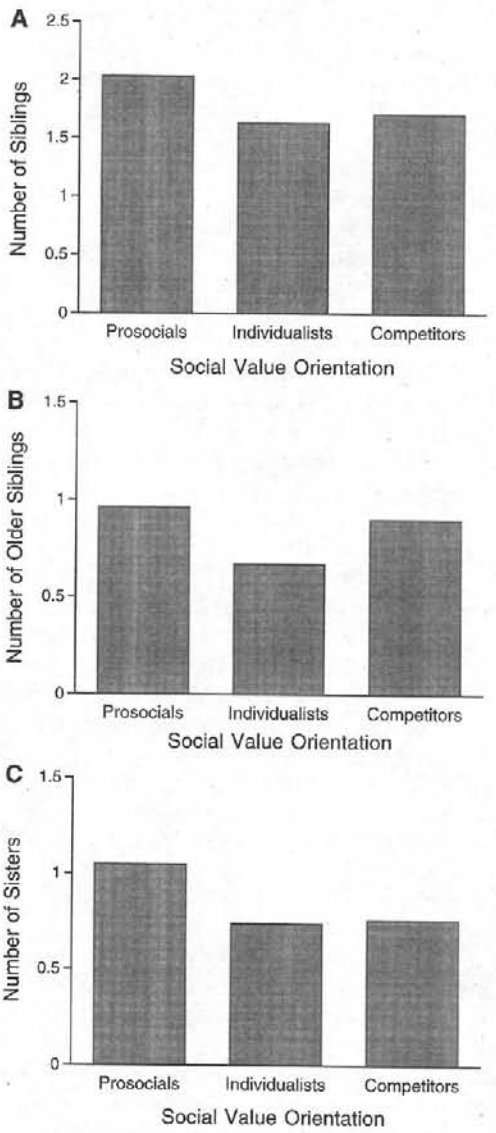

Figure 3. Mean number of siblings (Panel A), older siblings (Panel B), and sisters (Panel C) among prosocials, individualists, and competitors.

parisons revealed a significant contrast between prosocials versus individualists and competitors, $F(1, 535) = 9.14$, $p < .005$. Differences between individualists and competitors were not significant. The 3 × 2 ANOVA did not reveal any other significant effects (i.e., main or interaction effects involving gender).

Next, we conducted a 3 (social value orientation) × 2 (gender) MANOVA on the number of older siblings, the number of younger siblings, the number of brothers, and the number of sisters.[3] This analysis revealed a multivariate main effect for social value orientation, $F(8, 1066) = 1.99$, $p < .05$. At the univariate level, we found a significant main effect for social value orientation for number of older siblings, $F(2, 535) = 3.64$, $p < .05$, and number of sisters, $F(2, 535) = 6.16$, $p < .005$. First, Panel B of Figure 3 reveals that the number of older siblings was greater for prosocials ($M = 0.96$, $SD = 1.25$) than for individualists ($M = 0.67$, $SD = 0.79$). Subsequent comparisons revealed a significant contrast between prosocials versus individualists and competitors, $F(1, 535) = 4.94$, $p < .05$. Differences between individualists and competitors ($M = 0.90$, $SD = 1.02$) were not significant. Second, Panel C of Figure 3 reveals that the number of sisters was greater for prosocials ($M = 1.05$, $SD = 1.14$) than for individualists ($M = 0.74$, $SD = 0.75$) or competitors ($M = 0.76$, $SD = 0.88$). Subsequent comparisons revealed a significant contrast between prosocials versus individualists and competitors, $F(1, 535) = 12.27$, $p < .001$. Differences between individualists and competitors were not significant. The 3 × 2 ANOVAs did not reveal any other significant effects (i.e., main or interaction effects involving gender). Although several specific explanations may account for these findings, they are congruent with the more general assumption that differences in social value orientation are partially rooted in different patterns of social interaction as experienced, at least in part, during the periods spanning early childhood to young adulthood.

Study 4

Study 4 was designed to provide evidence relevant to the claim that social value orientations are further shaped by different patterns of social interaction as experienced during early adulthood, middle adulthood, and old age. Our primary purpose was to examine the possible relationship between the distribution of three types of social value orientations (i.e., prosocials, individualists, and competitors) and age differences among a sample of adults in the Netherlands. There are several lines of reasoning why a relationship between these variables is plausible, advancing either (a) the hypothesis that the percentage of prosocials increases with age, whereas the percentage of individualists and competitors decreases with age (i.e., *prosocial-growth hypothesis*) or (b) the hypothesis that the percentage of prosocials decreases with age, whereas the percentage of individualists and competitors increases with age (i.e., *proself-growth hypothesis*).

What logic would underlie the prosocial-growth hypothesis? We suggest three complementary lines of reasoning. First, one may assume that all three social value orientations have functional value, depending on certain features of interdependence and behavior of interaction partners. At the same time, there is good reason to believe that across differing interdependent situations and interaction partners a prosocial orientation is more functional than an individualistic or competitive orientation. Individuals with a prosocial orientation tend to behave in a tit-for-tat manner, approaching others cooperatively and turning to noncooperation if others fail to cooperate. Such strategies tend to enhance both long-term personal well-being and collective well-being and have been asserted to be functional from an evolutionary perspective (cf. Axelrod, 1984; Trivers, 1971).[4] It is possible that over a lifetime, individuals increasingly detect the functional aspects of a prosocial orientation, thus becoming more prosocial and less individualistic or competitive over time.

Second, one might assume that the nature of interdependence situations changes over the course of a lifetime (cf. Levinson, 1986). For example, young adults may especially confront situations with rather low levels of correspondence, in that they typically have to compete for scarce resources (e.g., competing for jobs, partners). Later, when facing middle adulthood, individuals tend to establish themselves (e.g., in terms of careers and family) and increasingly face interaction situations in which others depend on their help and service (e.g., children, junior colleagues). Then, when facing old age, individuals tend to become somewhat more dependent on others for the provision of good outcomes (e.g., need for help because of some restraints following from old age). Because the interdependence features that are characteristic of later life phases call for tendencies toward helping others (and to some degree, being helped), it is likely that prosocial orientation increases as a function of age. Moreover, this second account complements the first explanation, in that a more varied set of interaction experiences may further help individuals to detect the functional aspects of prosocial orientation.

Third, over the course of this century, many societies, including the Netherlands, have become less collectivistic, yielding lower levels of interpersonal closeness and interdependence (i.e., a movement from rural, interpersonally close cultures to urbanized, interpersonally distant environments). Accordingly, the probability of being raised in collectivistic subcultures decreases with age. Given the association between levels of collectivism and prosocial orientation, one might speculate that, if the primary orientations are developed during early childhood, prosocial orientation should increase with age.

What logic would underlie the proself-growth hypothesis? One might assume that individuals assign greater weight and attention to patterns of interaction that are harmful to their own well-being than to patterns that are helpful to their own well-being (cf. Fiske, 1980; Skowronski & Carlston, 1989). Given that the cumulative experience with incidents of harm in settings of interdependence increases with age, one might argue that levels of trust in the prosocial motivation of others tend to gradually decline with age. Such decline in trust may be associated with a decline in prosocial orientation and an increase in individ-

[3] We did not conduct a MANOVA for all five dependent measures because, logically, number of siblings is statistically related to the other four measures of siblings.

[4] Although few would doubt the functionality of tit for tat, it is not necessarily true that tit for tat would logically outperform all other possible interaction strategies (e.g., Selten & Hammerstein, 1984).

ualistic or competitive orientations (cf. Kuhlman et al., 1986; Pruitt & Kimmel, 1977).

Of lesser relevance, Study 4 enabled us to examine two additional questions. First, the present research used a large sample of participants that was representative of the Dutch adult population. This allowed us to compare the distribution of social value orientations obtained in this study with distributions observed in prior research that has used samples of primarily college students (these samples are sometimes referred to as *convenience samples*). Indeed, it is fair to conclude that researchers' knowledge about social value orientation, issues of cooperation and competition, and related topics is primarily based on data from college students, thus providing a somewhat restricted database for researchers' knowledge and theoretical development (cf. Sears, 1986). Therefore, we explored whether (and if so, how) the prevalence of prosocials, individualists, and competitors in these convenience samples is different from that of the adult population in the real world.

Second, Study 4 examined the relationship between social value orientation and gender. Prior research has revealed some evidence that women are more likely than men to exhibit cooperative choice behavior, although such findings have been inconsistently observed (for a review, see Komorita & Parks, 1994; Van Lange, Liebrand, Messick, & Wilke, 1992). Moreover, several studies have examined a link between social value orientation and gender, finding weak evidence that women are more likely to be classified as prosocial and less likely to be classified as individualistic or competitive (e.g., McClintock & Liebrand, 1988; Van Lange, 1992). However, the (relatively small) samples in these studies consisted of primarily college students. By using a large sample that was representative of the adult population, the present research examined whether the prevalence of prosocials is greater (and that of individualists and competitors smaller) among women than among men. Also, in an exploratory vein, we examined the association between social value orientation and level of education.

Method

Participants and design. A total of 1,728 individuals participated in this research. This sample comprised individuals who had agreed to participate once every week in surveys and research conducted by Telepanel, an organization linked to the University of Amsterdam. In exchange, each participant received a personal computer that was also used for surveys and research. This personal computer was connected with the main computer at Telepanel where the data were stored automatically. The Telepanel organization has made every attempt possible to recruit a sample of participants that is representative of the Dutch adult population. In the present sample, there were 940 (54.4%) men and 788 (45.6%) women; mean age was 45.7 years (age ranged from 15 years through 89 years). Slightly less than half of the participants had a (paid) job (48%), some were homemakers (20.1%), some were retired (14.3%), some were students (7.2%), a few were not able to work (3%), a few were unemployed (2.8%), and the remainder were involved in volunteer work or reported to be doing "something else" (4.6%). By using this sample, we examined the association between social value orientation (prosocials vs. individualists vs. competitors), age (15–29 years vs. 30–44 years vs. 45–59 years vs. 60 years and older), education (university or higher education vs. intermediate education vs. lower education), and gender (men vs. women).

Procedure. This study was part of a large survey that contained some questionnaires and a set of biographical questions to assess age, gender, and level of education. We included a series of six decomposed games (decomposed games 1 through 6; see Appendix) to assess participants' social value orientations. Paralleling the criteria used in prior research (i.e., at least 6 of 9 choices should be consistent with one of three social value orientations), participants were classified if they made at least five of six choices consistent with one of the three social value orientations. It appeared that 135 participants (7.8%) made fewer than five consistent choices and thus were not classified. From the remaining 1,593 participants, 1,134 (71.2%) were classified as prosocial, 340 (21.3%) were classified as individualistic, and 119 (7.5%) were classified as competitive.

Results and Discussion

Association between social value orientation, age, education, and gender. The theoretical basis for classifying individuals into distinct age categories was the work of Erikson and colleagues (Erikson, 1980; Erikson, Erikson, & Kivnick, 1986), which distinguished among early adulthood (i.e., 20–35 years old), middle adulthood (35–65 years old), and old age (i.e., at least 65 years old). However, we also wanted groups that (a) were not extremely unequal in size and (b) represented equal intervals. We therefore differentiated among four groups varying in age, individuals who were (a) older than 15 years but younger than 30 years ($n = 270$); (b) at least 30 and younger than 45 years ($n = 523$); (c) at least 45 and younger than 60 years ($n = 529$); and (d) 60 years or older ($n = 271$).

Levels of education were varied in three groups as follows: those who had completed or were currently pursuing university or higher education ($n = 336$), those who had completed or were currently enrolled in intermediate levels of education ($n = 382$), and those who had completed lower levels of education or who had not completed any form of education ($n = 875$). The sample consisted of 868 men and 725 women.

The association of age, level of education, and gender with social value orientation was analyzed in a 3 (social value orientation) × 4 (age) × 3 (education) × 2 (gender) log-linear analysis. We used a so-called hiloglinear analysis because our analysis included four variables (allowing for 3 × 4 × 3 × 2 = 72 cells) and because the variables were skewed in their distribution (cf. Knoke & Burke, 1980; Reynolds, 1977). This analysis revealed significant main effects for social value orientation, partial χ^2 (2, $N = 1593$) = 1061.72; age, partial χ^2 (3, $N = 1593$) = 166.88; education, partial χ^2 (2, $N = 1593$) = 314.90; and gender, partial χ^2 (1, $N = 1593$) = 12.85, (all ps $< .001$), indicating that none of these distributions were equal.

More important, and relevant to the primary hypotheses (i.e., the prosocial-growth hypothesis and the proself-growth hypothesis), the analysis revealed a Social Value Orientation × Age interaction, partial χ^2 (6, $N = 1593$) = 62.25, $p < .001$. As can be seen in Figure 4, the percentages of prosocials systematically elevated with increasing age (varying from 55.9% to 67.3%, 77.5%, and 81.5%), whereas the percentages of individualists (varying from 30.7% to 24.9%, 16.3%, and 15.1%) and competitors (varying from 13.3% to 7.8%, 6.2%, and 3.3%) decreased with increasing age. These findings are consistent with the prosocial-growth hypothesis and inconsistent with the proself-growth hypothesis.

Second, the analysis revealed a Social Value Orientation ×

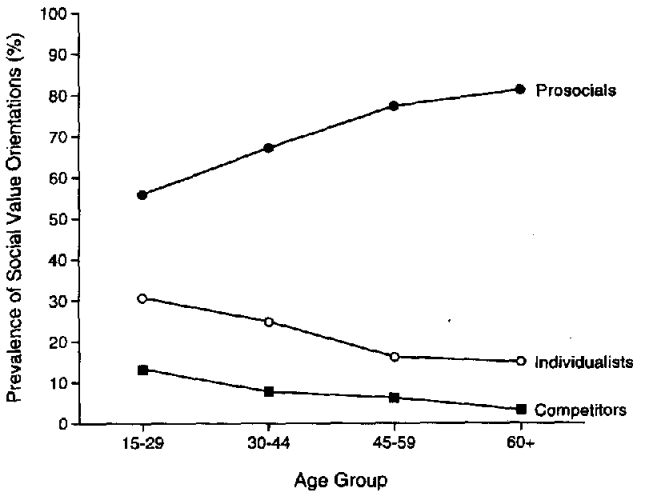

Figure 4. The prevalence of social value orientations (in percentages) among groups differing in age.

Gender interaction, partial χ^2 (2, N = 1593) = 15.61, p < .001. As predicted, the percentage of prosocials was higher among women (75.6%) than among men (67.5%), whereas the percentage of individualists was lower among women (18.1%) than among men (24.1%). The groups did not differ in terms of the percentage of competitors (6.3% and 8.4% for women and men, respectively). Third, we did not find a relationship between level of education and social value orientation; the Social Value Orientation × Education interaction was not significant, partial χ^2 (4, N = 1593) = 7.46.[5]

Comparison of distributions of social value orientations across studies. Another purpose of this study was to compare the distribution of social value orientations observed in a sample that was fairly representative of the Dutch adult population with the social value orientations observed in student populations, a common sample in research on social value orientations. We used data from two prior studies that have used identical instructions, except that these two data sets were based on nine decomposed games rather than six decomposed games as in the current work. The two prior studies involved sizable samples of primarily students living either in the United States or the Netherlands (Van Lange & Kuhlman, 1994, N = 349; Van Lange et al., in press, N = 336). However, because the distributions of social value orientations were almost identical in the two countries we do not further discuss the role of nation.

Table 1 presents the distributions observed in Van Lange and Kuhlman (1994), Van Lange et al. (in press), and the present study, broken down for different groups of individuals on the basis of age. As can be seen in Table 1, the distributions obtained in Van Lange and Kuhlman (1994) and Van Lange et al. (in press) were quite similar yet substantially different from the total, present distribution. In the present distribution, there was a greater percentage of prosocials and a lower percentage of individualists and competitors, χ^2 (4, N = 2278) = 28.88, p < .001. Next, we compared the distributions of the two prior studies with the present one, focusing on the group of individuals who were older than 15 yet younger than 30—a group that is comparable in age to the participants in the two prior studies. The distributions were not significantly different, χ^2(4, N = 955) = 2.97, *ns*, indicating that the percentages of prosocials, individualists, and competitors were indeed very similar in the three groups. We then compared the distributions of prior work with those of the present participants who were between 30 and 45 years of age, 45 and 60 years of age, and 60 years and older. Each comparison revealed significantly different distributions, χ^2(4, N = 1208) = 10.51, p < .05; χ^2(4, N = 1214) = 39.77, p < .001; and χ^2(4, N = 956) = 41.43, p < .001, respectively. Thus, these findings indicate that the distributions of social value orientations were very similar to that obtained for a sample representative of the Dutch adult population insofar as this sample consists of individuals of similar ages (i.e., between 15 and 30 years old).

General Discussion

The present research provides preliminary evidence in support of the claim that differences in social value orientation are (a) partially rooted in different patterns of social interaction as experienced during the period from early childhood to young adulthood and (b) further shaped by different patterns of social interaction as experienced during early adulthood, middle adulthood, and old age. Consistent with the prosocial-security hypothesis, Studies 1 and 2 revealed that prosocials exhibit greater levels of secure attachment than do individualists and competitors. This finding is congruent with the contention that social value orientation is partially rooted in experiences of interaction between the individual and the primary caregiver. Indeed, we are not aware of any personality construct that is linked so directly (theoretically and empirically) to personal histories of social interaction (cf. Ainsworth et al., 1978; Bowlby, 1969, 1973, 1980; Hazan & Shaver, 1987).

It is interesting that past research has revealed that high levels of attachment security are associated with experiences of favorable life outcomes (i.e., healthy relationships with intimate partners, parents, coworkers) as well as with the relative absence of psychosomatic symptoms (for a review, see Shaver & Hazan, 1993). Demonstrating a link between level of secure attachment and social value orientation is also important because it may help researchers understand why the level of secure attachment is related to the favorable life outcomes noted above. Granted, it is plausible that interpersonal attitudes and feelings of security (i.e., mental models; Hazan & Shaver, 1987) are an important ingredient toward maintaining healthy relationships. However, it is unlikely that such mental models operate in a vacuum, independent of an individual's own behavior in interdependent relationships. The present evidence in support of the prosocial-

[5] We observed three interaction effects that did not include social value orientation. First, an Age × Education interaction, partial χ^2 (6, N = 1593) = 64.73, p < .001, revealed that individuals with higher education were more prominent in the more mature groups. Second, an Education × Gender interaction, partial χ^2 (2, N = 1593) = 21.63, p < .001, revealed that men were relatively more prominent among individuals who had completed high levels of education. Third, an Age × Gender interaction, partial χ^2 (3, N = 1593) = 9.54, p < .05, revealed lower percentages of women with increasing age.

Table 1
Percentages of Prosocials, Individualists, and Competitors for Differing Age Groups (Study 4) and Differing Studies (Van Lange & Kuhlman, 1994; Van Lange et al., in press)

Social value orientation	Groups differing in age (Study 4)				Van Lange & Kuhlman (1994)	Van Lange et al. (in press)
	15–29	30–44	45–60	60+		
Prosocials	55.9	67.3	77.5	81.5	60.8	60.5
Individualists	30.7	24.9	16.3	15.1	27.2	25.2
Competitors	13.3	7.8	6.2	3.3	12.0	14.3

security hypothesis suggests that the link between level of secure attachment and favorable life outcomes is to some extent mediated by one's own behavior in interdependent relationships. That is, favorable life outcomes may also be promoted by the inclination to approach interdependent others in a prosocial manner, behaving in ways that serve both one's own well-being and the others' well-being. Of course, this line of reasoning is speculative and remains to be tested in future research.

A second major finding was that prosocials reported having more siblings than did individualists and competitors. This finding, which supports the sibling-prosocial hypothesis, is congruent with the notion that patterns of social interaction—as determined by number of siblings—shape the development of social value orientation. This observation is also consistent with the well-established finding that prosocial patterns of behavior are more prevalent among individuals raised in cultures characterized by high (rather than low) levels of collectivism, interpersonal closeness, interdependence, and large (rather than small) family size. The present research suggests that, in fact, family size alone may partially account for this finding.[6]

Why did we find support for the sibling-prosocial hypothesis (and why did we not find support for the sibling-proself hypothesis)? As noted earlier, it is plausible that a greater number of siblings is associated with a greater frequency—and possibly intensity—with which one is confronted with conflicts of interest (i.e., individuals are more strongly forced to share important resources). Presumably, such repeated experiences may force children (and parents) to develop cooperative and coordinating interaction styles, thus adapting in a collectively beneficial manner, thereby promoting prosocial orientation. The finding that individualists reported having fewer older siblings than did prosocials is congruent with the prosocial-security hypothesis and suggests that prosocial orientation is less likely to develop when fewer siblings are around in the first couple of years.

It is interesting that prosocials reported having more sisters than did individualists and competitors. Why is the number of sisters (rather than brothers) related to social value orientation? Studies 1 and 4 revealed that the prevalence of prosocials was somewhat greater—and that of individualists somewhat smaller—among women than among men.[7] One explanation would thus be that because sisters are more likely to be prosocial than brothers, individuals are more likely to adopt a prosocial orientation as the number of sisters increases (e.g., through patterns of reciprocity or modeling). A second—and somewhat more stereotypical—explanation would be that sisters more than brothers adopt a *mother role,* a repertoire of behaviors that involves nurturing, helping, and caring, thereby promoting prosocial orientation in the receiver (or the observer). Although these lines of reasoning are highly speculative, it is interesting to note that the current findings are in agreement with a recent finding indicating that, relative to fathers with no or a few sisters, fathers with many sisters devote greater time to raising their children (Duindam & Spruijt, 1996).

A third finding was that the prevalence of prosocials increased—and the prevalence of individualists and competitors decreased—with age, suggesting that differences in social value orientation are further shaped by different interaction experiences that are characteristic of early adulthood, middle adulthood, and old age. Why did we find support for the prosocial-growth hypothesis (and why did we not find support for the proself-growth hypothesis)? Earlier, we outlined three complementary lines of reasoning. The first explanation contends that over time and extended experience with interdependent situations and interaction partners, individuals may increasingly detect the functional aspects of prosocial motivation, an account that is congruent with the well-established finding that prosocial behavior among children and young adults increases with age. The second explanation assumes that the nature of interdependence situations and social interaction changes and evolves during a lifetime, suggesting that situations over a lifetime tend to increasingly call for tendencies toward helping others (and to some degree, being helped by others). Such features may also enhance prosocial orientation because they contribute to a more varied set of interaction experiences, which may further help individuals detect the functional aspects of prosocial orientation. The third explanation centers on the cultural–historical determinants of prosocial orientation, arguing that many societies, in-

[6] We are aware of one study that has examined whether cultural differences in cooperativeness and competitiveness are partially accounted for by family size differences (Knight & Kagan, 1982). This study compared Anglo American and Mexican American children and revealed greater levels of cooperation among Mexican American children (children who were raised in larger families). However, they did not find a link between degree of cooperativeness–competitiveness and number of siblings (or birth order). Thus, in this study, number of siblings and birth order did not account for the differences observed between Anglo American and Mexican American children.

[7] Social stereotypes suggest that women are considerably more prosocial and less competitive than are men. The current findings suggest that in actuality such differences tend to be rather small. Also, the current evidence in support of small differences between women and men is consistent with research on prosocial behavior among children, which also reveals modest differences between the genders (for a review, see Durkin, 1995).

cluding the Netherlands, have become less rural, less collectivistic and more urban, more individualistic over the past decades. It should be clear that our findings do not enable us to draw any firm conclusions regarding the relative validity of these interrelated explanations.

It is important to note that our findings do not support the proself-growth hypothesis, a prediction that was based on the notion that levels of trust may decrease with increasing age. In retrospect, it might be questionable (a) whether individuals continue to assign greater weight to potentially harmful behavior, (b) if they do, whether individuals draw firm conclusions about humankind on the basis of such experiences, and (c) whether lower levels of trust necessarily translate in a movement away from prosocial orientation (cf. Parks, 1994). It could be that with increasing age, individuals become more prosocial, even though they (increasingly) believe that most people are not prosocial.

We should acknowledge several limitations of the present research. First, the present work did not provide insight into the nature of social interaction experiences underlying relationships with the primary caregiver or siblings that may guide the development of prosocial, individualistic, or competitive orientations. In a similar vein, the present research did not directly assess how social interaction experiences may differ as a function of age. Indeed, future research on the developmental aspects of social value orientations would benefit from a much needed typology (or atlas) of social interaction experiences for individuals differing in attachment style, number of siblings, and age. A final limitation is, of course, that we have not provided insight into the several correlates (e.g., religion, socioeconomic status) of attachment differences, number of siblings, and age—variables that potentially contribute to furthering the understanding of the development of social value orientation.

We wish to close by drawing attention to the finding that the distribution of social value orientation among convenience samples was similar to that of a sample assumed to be representative of the Dutch adult population, so long as these samples are comparable in terms of age (i.e., 15–30 years old). Such findings strengthen the confidence one may have in the generalizability of the extant literature on social value orientations. At the same time, because prosocial orientation systematically increases with age, studies with participants who have not yet reached middle adulthood might lead researchers to draw conclusions about the selfishness of human nature that are not entirely justified. Indeed, classic principles of rational self-interest or economic man (Luce & Raiffa, 1957; Von Neuman & Morgenstern, 1947) seem too limited to explain fully the social–motivational underpinnings of social interaction phenomena.

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Appendix

An Instrument to Measure Social Value Orientation

In this task we ask you to imagine that you have been randomly paired with another person, whom we will refer to simply as the "Other." This other person is someone you do not know and that you will not knowingly meet in the future. Both you and the "Other" person will be making choices by circling either the letter A, B, or C. Your own choices will produce points for both yourself and the "Other" person. Likewise, the other's choice will produce points for him/her and for you. Every point has value: The more points you receive, the better for you, and the more points the "Other" receives, the better for him/her.

Here's an example of how this task works:

	A	B	C
You get	500	500	550
Other gets	100	500	300

In this example, if you chose A you would receive 500 points and the other would receive 100 points; if you chose B, you would receive 500 points and the other 500; and if you chose C, you would receive 550 points and the other 300. So, you see that your choice influences both the number of points you receive and the number of points the other receives.

Before you begin making choices, please keep in mind that there are no right or wrong answers—choose the option that you, for whatever reason, prefer most. Also, remember that the points have value: The more of them you accumulate, the better for you. Likewise, from the "other's" point of view, the more points s/he accumulates, the better for him/her.

For each of the nine choice situations, circle A, B, or C, depending on which column you prefer most:

		A	B	C
(1)	You get	480	540	480
	Other gets	80	280	480
(2)	You get	560	500	500
	Other gets	300	500	100
(3)	You get	520	520	580
	Other gets	520	120	320
(4)	You get	500	560	490
	Other gets	100	300	490
(5)	You get	560	500	490
	Other gets	300	500	90
(6)	You get	500	500	570
	Other gets	500	100	300
(7)	You get	510	560	510
	Other gets	510	300	110
(8)	You get	550	500	500
	Other gets	300	100	500
(9)	You get	480	490	540
	Other gets	100	490	300

Note. Participants are classified when they make 6 or more consistent choices. Prosocial choices are 1c, 2b, 3a, 4c, 5b, 6a, 7a, 8c, 9b; individualistic choices are 1b, 2a, 3c, 4b, 5a, 6c, 7b, 8a, 9c; and competitive choices are 1a, 2c, 3b, 4a, 5c, 6b, 7c, 8b, 9a.

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